Replication: "Expenditure Response to Increases in In-Kind Transfers: Evidence from the Supplemental Nutrition Assistance Program"

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July 21, 2017

Outline

Rise of Replication

- A famous study in Journal of Money, Credit, and Banking demonstrated the need for replication in the field of economics (Dewald, Thursby, and Anderson 1986)
  - Many minors errors and few major errors that changed qualitative conclusions
  - But, likely positive selection– those in upper tail of study quality represented
- Many journals including AER, PFR, and many others encourage replication of published empirical results for publication and/or require authors to submit data and code for replication.

Recent Calls for Replication

A Call for Replication Studies

Leonard E. Burman,[1] W. Robert Reed[2] and James Alm[3]

"It is our belief that journals should publish the results of replication attempts—favorable or unfavorable."

—Dewald, Thursby, and Anderson (1988)

"Econometric software has bugs."

—McCullough and Vinod (1999)

"... [R]eplicable economic research is the exception and not the rule."

—Anderson et al. (2005)

Recent Calls for Replication

The *JAE* Replication Section, introduced in January 2003 under the editorship of Badi H. Baltagi, was initially devoted exclusively to the issue of replication of empirical results published in papers of the *Journal of Applied Econometrics*.

Given the encouraging response that the *JAE* has received, we have now decided to extend the coverage of the section. We are now inviting submissions of replication of empirical results that have been published in the following additional journals:

- *Econometrica*
- *American Economic Review*
- *Journal of Political Economy*
- *Quarterly Journal of Economics*
- *Review of Economics and Statistics*
- *Review of Economic Studies*
- *Journal of Econometrics*
- *Journal of Business and Economic Statistics*
- *Economic Journal*

Defining Replication

- Replication has several flavors (Hamermesh 2007)
  - **Pure replication**
    - **Checking on others' published papers using their data**
  - Statistical replication
    - Different sample, but the identical model and underlying population
  - Scientific replication
    - Using data representing different populations in one's own work or in a comment
    - Different sample, different population, and perhaps similar but not identical model
    - Hamermesh calls for more of this flavor in economics

Motivation

- Last fall, I took a course on replication in applied economics at University of Wisconsin-Madison. Over the semester, we selected a paper to replicate, gathered the data and code, and attempted to replicate the results of the selected paper.
- I chose Beatty, T. K., Tuttle, C. J. (2014). Expenditure response to increases in in-kind transfers: Evidence from the Supplemental Nutrition Assistance Program. American Journal of Agricultural Economics, 97(2), 390-404.

Supplemental Nutrition Assistance Program (SNAP) Program

- Goal: Increase the food spending of needy households
- Increased participation due to Great Recession and eligibility expansions
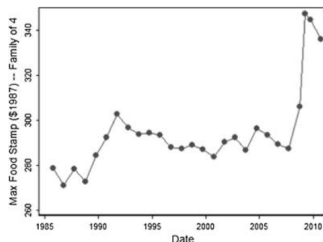- American Recovery and Reinvestment Act of 2009 increased per household benefits by $80 on average

Figure 1. Maximum allotment for family of 4: 1985–2011

Motivation

When food expenditure > SNAP benefits,

- ▶ Economic theory predicts households will treat SNAP benefits as if they were *cash* (Southworth, 1945)
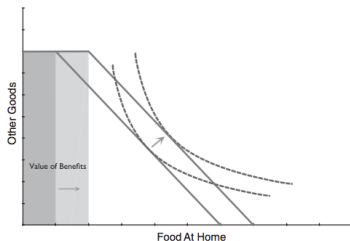- ▶ Empirical work finds households will *increase* their food budget share

Figure 2. Expenditure changes due to an increase in SNAP benefits

Literature

Studies predate the "credibility revolution"

- ▶ Increase in SNAP results in 17-47 cent increase in food spending while equivalent cash transfer increases food spending by 5-10 cents (Senauer and Young 1986; Fox, Hamilton, Lee 2004; Wilde, Troy, and Rogers 2009; Fraker 1990)

- ▶ Mixed findings from cash-out experiments of 1980s and 1990s (Moffitt 1989; Levedahl 1995; Breunig and Dasgupta 2002, 2005; Whitmore 2002)

- ▶ Study using phased implementation in 1960s and 1970s findings predicted by economic theory (Hoynes and Schazenbach 2009)

Study Objectives

- ▶ Effect of large increase in SNAP benefits from ARRA 2009 on food spending of infra marginal participant households
- ▶ Estimates for current program
- ▶ How do SNAP participants respond to increases in their SNAP benefits
- ▶ Effectiveness of federal policy at addressing consequences of the economic downturn

Conceptual Framework

Engel curve

- ► As total expenditure increases, food share falls
- ► Food is necessity, normal good

Labelling effect

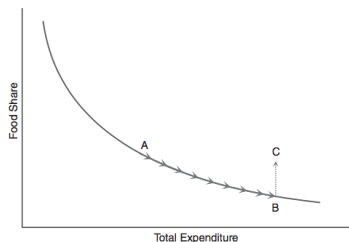- ► Different MPS out of SNAP benefits than cash results in shift

Figure 3. Engel curves: labeling effect

Data: Consumer Expenditure Survey (CE)

- Unlike many of my classmates, my project required me to start my replication from raw data versus a "clean" dataset from the authors
- The authors used the Family Interview Survey (FMLI) of the Consumer Expenditure Survey
  - Buying habits of U.S. consumers
  - Two components: Interview Survey and Diary Survey
  - Data on large purchases and regular expenditures, like food

- Quarterly household survey
- Households followed for 4 quarters
- 2007 – 2010

Results

Table 4. Main Results: 2007–2010

Variables	(1) Food-at-Home Share	(2) Food-at-Home Share
After	−0.203**	−0.179*
	(0.096)	(0.095)
DiD_1	0.723**	
	(0.326)	
DiD_2		0.118*
		(0.647)
ln TotalExp_{ht}	−4.716***	−4.718***
	(0.405)	(0.406)
Constant	53.275***	53.292***
	(3.208)	(3.201)
Observations	19,328	19,328
R-squared	0.0750	0.0745

Notes: Regressions include household, year, and month fixed effects. Cluster robust standard errors in parentheses. *, **, and *** represent 10%, 5%, and 1% significance levels, respectively.

- SNAP benefit increase increased FAH share of total expenditure by 0.72%
- 0.12% increase in FAH share in response to 1% increase in SNAP benefits

Strengths of CE: Data download and cleaning

- ▶ Easy to navigate CE website and download raw data in STATA format
- ▶ Getting Started Guide and annual survey documentation are very helpful!

- Observe quarterly food expenditures pre- and post-policy intervention
  - Food at home expenditure
  - Food away from home expenditure
  - Total expenditure
- Self-report of SNAP participation and SNAP benefit amount
- Demographic variables for coarsened exact matching to construct control group

- Compare results from CE with estimates using Current Population Survey-Food Security Supplement
- Findings robust to results using another dataset

Main Results with CE Data

Table 4. Main Results: 2007–2010

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Main Results with CPS-FSS Data

Table 7. CPS – FSS: Food and Supermarket Expenditure

Variables	(1) Log Food Expenditure	(2) Log Food Expenditure	(3) Log Food Away from Home	(4) Log Food Away from Home
CPS After	−0.018***	0.020***	−0.011	−0.002
	(0.005)	(0.005)	(0.008)	(0.011)
CPS DiD$_1$	0.127***		−0.078	
	(0.0021)		(0.050)	
CPS DiD$_2$		0.0005***		−0.000
		(0.008)		(0.000)
Constant	4.553***	4.552***	3.326***	3.310***
	(0.003)	(0.004)	(0.006)	(0.007)
Observations	58,052	38,509	37,041	24,183
R-squared	0.001	0.002	0.006	0.004

Notes: Regressions include household, year, and month fixed effects. Cluster robust standard errors in parentheses. *, **, and *** represent 10%, 5%, and 1% significance levels, respectively.

- Underreporting of SNAP participation and SNAP benefit amount
- Authors compare estimates using CPS-FSS data
    - CPS-FSS participation rate = 7.4%
    - CE participation rate = 5%
    - FRAC participation rate = 15%

    - CPS-FSS benefit increase = 9%
    - CE benefit increase = 17%

- Policy intervention does not map perfectly with collection period prefer calendar period
- Contacted BLS to learn how to fix key dependent variable
- Difficult to find out the fix from documentation without knowing where to look

Conclusions

- Important to promote replicability of empirical results and publication of replication studies
- Useful learning tool for graduate students and other researchers
- Replication from CE raw data was fairly straightforward although
    - Issue with documentation
    - Representativeness of SNAP recipients in sample

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Thank you!